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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/11434

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl⁷ F16J15/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl⁷ F16J15/32

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2003
Kokai Jitsuyo Shinan Koho 1971-2003 Toroku Jitsuyo Shinan Koho 1994-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2002-98163 A (Koyo Seiko Co., Ltd.), 05 April, 2002 (05.04.02), Full text; Figs. 1, 2 (Family: none)	1-4
Y	JP 9-292031 A (NOK Corp.), 11 November, 1997 (11.11.97), Claim 1; Par. No. [0008]; Figs. 1, 5 (Family: none)	1, 4
Y	US 6276691 B1 (NOK Corp.), 21 August, 2001 (21.08.01), Fig. 1 & JP 11-311338 A Par. No. [0028]; Fig. 1 & EP 939257 A2	1

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
05 December, 2003 (05.12.03)

Date of mailing of the international search report
16 December, 2003 (16.12.03)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002-0074734 A1 (Hans Reinhart), 20 June, 2002 (20.06.02), Full text; Fig. 3 & JP 2001-355741 A Par. No. [0017]; Fig. 3 & DE 10019994 A & EP 1156242 A2 & KR 2001-98799 A & US 6520506 B2	4